

## **DIVISION 7**

### **THERMAL AND MOISTURE PROTECTION**

#### **07311 ASPHALT SHINGLES**

##### **PART 1 – GENERAL**

###### **1.1 WORK**

- A. Provide everything required to complete the work as listed on the **Scope** and specified herein.
- B. Where additional instruction is required, work shall be as directed by the **Inspector**.
- C. Work includes all shingles, asphalt roofing felt, flashing, drip edge, vents, connectors, and related materials.

###### **1.2 QUALITY STANDARDS**

- A. Provide skilled, trained, experienced and competent workers to complete the work as specified.
  - Capable of handling any special heavy-duty or high-lift operations.
  - Sufficient in number for the work and time schedule.
- B. All work shall be completed in accordance with state and local building codes and manufacturer's instructions.
- C. Low pitched roofs:
  - Asphalt shingles shall not be installed on roofs less than 2" rise in 12" of run.
  - Install waterproof roofing membrane per manufacturer's instructions on roofs pitched between 3" through 4" rise in 12' of run.

###### **1.3 SUBMITTALS**

- A. Submit manufacturer's data required to prove compliance with these **specifications**.
  - Do not start work until **Owner** has approved and signed the Owner's Selection Sheet indicating approved shingle color and type (See Appendix A).
  - Provide **Owner's** written approval of shingle color and type to the **Agency**.
  - Submit manufacturer's installation instructions (usually found on shingle packaging).
  - Submit to the **Owner**, a copy of the manufacturer's roofing warranty.

###### **1.4 MATERIALS HANDLING AND STORAGE**

- A. Provide all materials required to complete the work.
  - Materials and products delivered will be certified by the manufacturer to be as specified.
  - Do not install any used, damaged, defective or unsatisfactory materials.
- B. Handling:
  - Deliver and transport materials to avoid damage to the product or to any other work.
  - Keep all materials to be installed dry.
- C. Storage:
  - Store materials off the ground, protected from dirt, ground moisture, contaminants, and weather.
  - Neatly stacked to prevent damage.
  - Protected from occupant and construction traffic.
  - Stored with level support to prevent toppling.

###### **1.5 PRECONSTRUCTION AND PREPARATION**

- A. Examine and verify that job conditions are satisfactory for speedy and acceptable work.
  - Check that weather conditions will be acceptable for work.
  - Provide framing, bracing and shoring as necessary to safely complete the work.
  - Provide lifts, cranes, ladders or scaffolding to assist high-level roofing work.
  - Verify that materials are stored so as to not overload or interfere with construction in terms of quantities and weights, locations, or traffic.
  - Have on hand and ready for installation in coordination with roofing, all flashing, roof vents, drip edging, sheet metal, roof cement, underlayment, water shield, and fasteners.

B. Protection of exposed roof:

- Have on hand adequately sized waterproof tarps or covers to protect exposed roof in the event of inclement weather.
- Securely attach tarps or covers to prevent wind, rain, snow or other weather related condition from dislodging coverings.
- **Contractor** shall be responsible for repairing at **Contractor's** expense, any damage caused by **Contractor's** failure to install, secure and adequately maintain roof protection during construction period.

## PART 2 – MATERIALS

### 2.1 ASPHALT SHINGLES, ACCESSORIES, AND RELATED MATERIALS

A. Asphalt shingles shall be as manufactured by a recognized roofing product manufacturer.

- Shingles must have an Underwriters Laboratory (UL) "Class A" rating.
- Shingles must meet the UL 997 Wind Resistance of Prepared Roof Covering Materials standard.
- Shingles must meet the ASTM D3462 Asphalt Shingles Made From Glass Felt and Surfaced with Mineral Granules standard.
- Shingles must meet the ASTM D3018 "Class A" Asphalt Shingles Surfaced with Mineral Granules standard.

B. Product details:

- Minimum weight: 240-245 lbs./square.
- Minimum three tabs per shingle.
- Minimum 25-year manufacturer warranty.

C. Underlayment:

- Use 15# asphalt-saturated roofing felt.
- Eave protection membrane underlayment shall be self-adhesive rubberized asphalt sheet from the same manufacturer as the shingles.
- Wood underlayment shall be an exterior grade plywood, waferboard, or OSB with a minimum thickness of 3/8 inch.

D. Nails:

- Use hot-dipped, zinc-coated steel roofing nails.
- Use nails of sufficient length to penetrate roof sheathing.
- Follow all nail size requirements and nail spacings required by the building code.

E. Power-driven nailing and staples shall comply with the following:

- Power driven nailing shall comply with State and Local building code standards.
- International Staple, Nail and Tool Association (<http://isanta.org/>) standards as outlined in the ICC Evaluation Services, Inc. ([www.icc-es.org](http://www.icc-es.org)) Legacy Report (NER-272), © January 1, 2004.

F. Plastic cement shall be asphalt-type cement with mineral fiber components.

G. Flashing shall be non-corrosive sheet metal or aluminum.

- 24 gauge hot-dip galvanized steel sheet.
- 0.032 inch aluminum sheet.
- Plumbing vent stacks shall be flashed with code approved methods.

H. Drip edge or gutter flashing shall be non-corrosive sheet metal or aluminum installed at eaves and gables.

I. Roof vents:

- Square roof vents shall be of non-corrosive sheet metal or aluminum, brown, black or aluminum in color.
- Continuous ridge vent shall be non-corrosive sheet metal or aluminum, brown or black in color.

## PART 3 – INSTALLATION

### 3.1 TEAR-OFF OF EXISTING ROOFING MATERIALS

A. Examine and verify that job and weather conditions are satisfactory for speedy and acceptable work.

B. Tear-off preparation:

- Install safety barricades, fencing, or other warning devices to prevent the building occupants or unauthorized individuals from entering the work area.
- Install plastic or tarps around exterior of building to collect falling debris from roof.
- Install plastic or tarps in attic or other interior areas to completely collect falling debris from roof.

- The **Contractor** shall take all necessary precautions to protect the building, its components, i.e. windows, doors, gutters, siding, etc. and any neighboring buildings, structures, vehicles, etc. from falling debris.
- All plantings and shrubbery shall be protected from damage by falling debris.
- **Contractor** will be responsible for any damage caused as a result of **Contractor's** work.
- **Contractor** is responsible for completely removing from the property all debris generated from removal of roofing materials at contractor's expense.
- All debris including roofing materials, nails, scrap lumber, flashing, etc. shall be removed from site or neatly stored at the end of each workday.
- All sidewalks, driveways, patios, etc. shall be broom swept daily.

C. Tear-off:

- Remove all of the existing roofing materials down to the roof deck.
- Verify that deck is dry, sound, clean, and smooth, free of protruding nails, staples, or other projections.
- Repair all holes over 1 inch in diameter, all cracks over ½ inch in width, loose knots, depressions, rotten wood or defective roof boards.
- Replace defective decking as necessary to provide a structurally sound deck surface.

### 3.2 UNDERLAYMENT INSTALLATION

A. Install underlayments in accordance with building code and manufacturer's instructions.

B. If listed in the **Scope**, wood roof deck underlayment shall be:

- Installed directly over entire existing wood deck material.
- Secured in place with fasteners of sufficient size and length per the building code and as specified herein.
- Underlayment shall be placed to allow a 1/8 inch gap around all edges for expansion.
- Edge joints in successive rows shall be staggered.
- Edges of sheets shall break on rafters.
- Install deck or sheathing with firm complete supports.

C. Install eave protection membrane as listed in the **Scope**, and always on roofs pitched between 3" through 4" rise in 12' of run.

- Install eave protection membrane up the slope from eave edge to 36 inches from the edge or at least 24 inches beyond the interior face of the warm exterior wall, whichever is greater.
- Lap ends 6 inches and bond.
- At vent pipes, install a 24-inch square patch of eave protection membrane lapping over the roofing felt, seal tightly to pipe.
- At vertical walls, install eave protection membrane extending at least 6 inches up the wall and 12 inches on to the roof surface lapping over roofing felt.
- At chimneys, install eave protection membrane around entire chimney extending at least 6 inches up the wall and 12 inches on to the roof surface lapping over the roofing felt.

D. Use 15# asphalt-saturated roofing felt.

- Install one layer of roofing felt over entire roof deck area not protected by eave or valley membrane.
- Run sheets horizontally lapped so water sheds.
- Nail in place per manufacturer's instructions and as specified herein.
- On roofs sloped greater than 4 in 12, lap horizontal edges at least 2 inches and at least 2 inches over eave protection membrane.
- On roofs sloped between 3 in 12 and 4 in 12, lap horizontal edges at least 19 inches and at least 19 inches over eave protection membrane.
- Lap ends at least 4 inches; stagger end laps of each layer at least 36 inches.
- Lap underlayment over valley protection at least 6 inches.
- At vent pipes, seal asphalt roofing felt tightly to pipe.
- At vertical walls, install asphalt roofing felt extending at least 6 inches up the wall.
- At chimneys, install asphalt roofing felt around entire chimney extending at least 6 inches up the wall.
- At skylights and roof hatches, install asphalt roofing felt from under the built-in counterflashing and on to the roof surface.

### 3.3 FLASHING

- A. Prior to shingling install metal hip, valley, and cricket flashing per manufacturer's instructions and as specified herein.
- Provide compatible flashing materials.
  - Complete flashings as required during and at the conclusion of shingling.
  - Use asphalt roofing felt or if listed in the **Scope**, waterproof membrane, under metal valley flashing, run continuously from ridge to eave.
  - Do not nail through metal valley flashing; secure by nailing at 18 inches on center just beyond edge of flashing so that nail heads hold down edge.
  - Step flashing shall be used at side walls, dormers, and chimneys.
  - Install counterflashing around chimney skylights, roof hatchways, etc.
- B. Install metal drip edge:
- At rake edges and at eaves without gutters.
  - Tightly to rake or fascia boards.
  - Sealed with roofing cement over top of asphalt roofing felt or eave protection membrane.
  - Lapping joints at least 2 inches.
  - Use full-length pieces; do not piece together scraps.
  - Secure with approved fasteners as specified herein.
- C. Install gutter flashing at eaves:
- Below the roofing felt.
  - Seal asphalt roofing felt to top of gutter flashing with roofing cement.
  - Flashing shall be tight against the fascia board and roof deck.
  - Use full-length pieces; do not piece together scraps.
  - Secure with approved fasteners as specified herein.
  - Install roof deck mounted gutters, flashing and straps directly to roof deck prior to applying roofing underlayment, asphalt felt paper and shingles.

### 3.4 SHINGLE INSTALLATION

- A. Install shingles in accordance with manufacturer's instructions, the building code, and as specified herein.
- Avoid breakage of shingles by avoiding dropping bundles on edge, by separating shingles carefully, and by taking extra precautions in temperatures below 40 degrees Fahrenheit.
  - Handle shingles carefully in hot weather to avoid damaging shingles.
  - Secure each shingle with proper number and type of fastener per manufacturer's instructions and as specified herein.
  - Space each joint a minimum of 1 ½ inches from adjacent course.
  - Double shingles at first course to form a 1-inch drip edge.
  - Install shingles so there is no visible deviation from alignment.
  - Do not allow nails to penetrate decking or sheathing so as to be visible from below.
  - Make hips or ridges using shingles required by manufacturer.
- B. If listed in the **Scope**, install ridge vent along entire length of ridges.
- Cut continuous vent slot through wood roof sheathing or decking, stopping 12 inches from each end of the ridge.
  - On roofs without ridge board, make a slot 2 inches wide, centered on ridge.
  - On roofs with a ridge board, make two slots 1 ¾ inches wide, one on each side.
  - Install ridge vent material full length of ridge slot(s) extending the vent material 6 inches beyond the end of slot(s).
  - Join ends of vent material per manufacturer's instructions.
- C. Individual roof vents:
- Replace individual roof vents with new vents of non-corrosive sheet metal or aluminum similar in size, color, and configuration to vent it is intended to replace.
  - Install vent per manufacturer's instructions.
- D. Open valley technique:
- Snap diverging chalk lines on metal flashing, starting at 3 inches each side of top of valley, spreading at 1/8 inch per foot to eave.
  - Run shingles to chalk line.

- Trim last shingle in each course to match chalk line; do not trim shingles to less than 12 inches width.
  - Apply 2-inch wide strip of plastic cement under ends of shingles, sealing them to metal flashing.
- E. Closed valley technique:
- Run the first, and only the first, course of shingles from the higher roof slope across the valley at least 12 inches.
  - Run all courses from lower roof slope across the valley at least 12 inches and nail not closer than 6 inches to center of valley.
  - Run shingles from the upper roof slope into valley and trim 2 inches from center of valley.
- F. Woven valley technique:
- Do not make woven valley with laminated type shingles or when not allowed by manufacturer's instructions.
  - Run shingles from both roof slopes at least 12 inches across center of valley, lapping alternate sides in a woven pattern.
  - Nail not closer than 6 inches to center of valley.

### 3.5 INSPECTION AND CLEAN-UP

- A. **Contractor** is responsible for thoroughly cleaning up the work area.
- At completion of work, **Contractor** is responsible for completely removing from the property, at **Contractor's** expense, all debris generated from removal and installation of roofing materials.
  - At the end of each workday, all debris including roofing materials, nails, scrap lumber, flashing, etc. shall either be removed from site or neatly stored.
  - Leave drains, gutters, and downspouts clear and clean of debris.
  - All sidewalks, driveways, patios, etc. shall be broom swept daily.
  - Repair or replace defective work as directed by the **Inspector**.

END OF SECTION – 07311 ASPHALT SHINGLES